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12) # REQUEST OF PATENT

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73) Holder(s)

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60) Reference to other national documents related:

54) Intersomatic Cervical Cage

57) The invention concerns an element of internal setting and of intersomatic fusion of the vertebras during diskectomy refered to by the name of Intersomatic Cage.

The characteristics of the cage are the following:

- Made in polyethylene or equivalent material, resorptive or not, it introduces a factor of absorption that reduces the transmission of stress.
- Geometrically, the cage presents the shape of a parallelepiped and can comprise or not a median wall of reinforcement (2). Its anterior (5) and posterior (6) sides have a height determined to secure the preservation of normal intervertebral space and lordosis.
- The edges of each side of the cage are provided with notches (11) meant to avoid movings.
- Fit out in its central part of a radiopac allowing to follow with time, the moving of the implant and allowing to do disrupted radiological exams and MRI.
- Available volumes to put bone pieces of suitable dimensions.

DEMANDS

1) Element of internal setting and intersomatic fusion of the vertebras during diskectomy, characterized in that it is like a rigid structure with the shape of a cage meant to squeeze some cancellous bone.

2) Element of internal setting and intersomatic fusion of the vertebras according to Demand 1, characterized in that the rigid structure has the shape of a parallelepiped.

3) Element of internal setting and intersomatic fusion of the vertebras according to any of the previous Demands 1 to 2, characterized in that the respective heights of the anterior (5) and posterior (6) sides of the cage allow to keep normal intervertebral height and lordosis.

4) Element of internal setting and intersomatic fusion of the vertebras according to any of the previous Demands 1 to 3, characterized in that the edges of the sides are provided with notches.

5) Element of internal setting and intersomatic fusion of the vertebras according to any of the previous Demands 1 to 4, characterized in that the lateral sides 9 and 10 present the shape of isosceles trapeziums.

6) Element of internal setting and intersomatic fusion of the vertebras according to any of the previous Demands 1 to 5, characterized in that the cage is made with polymer material, resorptive or not, like polyethylene with big molecular weight and nonmagnetic allowing scanner exams or IRM without artifact.

7) Element of internal setting and intersomatic fusion of the vertebras according to any of the previous Demands 1 to 6, characterized in that the cage comprise a median wall of reinforcement which edges are provided with notches.

8) Element of internal setting and intersomatic fusion of the vertebras according to any of the previous Demands 1 to 7, characterized in that the volume of squeezed bone allows osseous communication between the lower and the upper vertebras.

9) Element of internal setting and intersomatic fusion of the vertebras according to any of the previous Demands 1 to 8, characterized in that it comprises a radiopac marker allowing to follow, with time, its positioning.

This invention concerns a setting cage, named Intersomatic Cage, meant to be inserted between two vertebras. Such an insertion allows propping up the space liberated by the diskectomy and to do the setting of a bone graft meant to merge the two vertebras.

The development of the procedure plans the following steps:

1) Access to the anterior side of the cervical rachis by incision in a fold of the neck.
2) Vertical incision on the median line of the prevertebral muscles and setting of a transversal autostatic retractor.
3) Radiolocation of the displayed disc and setting of blocks screwed in the middle of the above and under vertebral body.
4) Vertebral distraction and complete diskectomy. Abrasion of the anterior lips of the adjacent plateaus.
5) Curetting of the plateaus and updating of the cancellous on each intervertebral side to enhance the bone conduction.
6) Filling of the cage using two parallelepiped of cancellous bones brimming over on around 1mm on the two sides.
7) Setting of the cage.
8) Ablation of the distraction and closing of the incision.

The metallic implants have the disadvantage to be rigid, and so, to transmit in full the constraints and to be, under certain conditions, an obstacle to the good restoration of the bones. Moreover, they have a heavy weight and they cause artifacts during scanner and MRI.
The intersomatic cage, subject of this invention, gives a solution to these disadvantages.

The characteristics of the cage are the following:

- Made in polyethylene or equivalent material, resorptive or not, it introduces a factor of absorption that reduces the transmission of stress.
- Geometrically, the cage presents the shape of a parallelepiped. It can have a different shape and can comprise or not a median wall of wall of reinforcement (2). Its anterior (5) and posterior (6) sides have a height determined to secure the preservation of normal intervertebral space and lordosis.

The edges of each side of the cage are provided with notches (11) meant to avoid movings.
Fit out in its central part of a (...) allowing to follow with time, the moving of the implant and allowing to do disrupted radiological exams and MRI.

- Available volumes to put bone pieces of suitable dimensions allow the uninterrupted bone communication between the (...) vertebras, getting this way, the intersomatic fusion.

The intersomatic cage is characterized in our case, by a particular geometry illustrated on the plate 1/1 but which is not restrictive, and on the other way, the use of plastic material, polyethylene for example, is planned for its creation. Other materials, resorptive or not, showing the same characteristics can be considered. This material secures a good mechanical standard of the cage, while introducing a damper effect that diminishes the inconvenience.

While squeezing the cancellous bone, the cage enhances the bone fusion in a permanent way. This, opposed to free insertions of parts of bones which, not being in situ restrained, would then have the tendancy to migrate and induce an imbalance between the sides of the vertebral bodies.

Figure 1 illustrates the geometrical characteristics but non restrictive of the cage. This one is made by an irregular parallelepiped (1) comprising a median wall (2) used as a reinforcement. In this case, this wall determines two seatings (3) and (4).

Each seating will be equipped with a bone graft during the setting. The cage can have a different surface for the bone seating, separations, or be alveolate.

The height of its posterior side (6) is sufficient to allow the maintenance of a normal cervical height. The one of the anterior side (5) is lightly more important to allow obtaining a suitable degree of lordosis.

The anterior face comprises two drillings meant to the setting of the cage using a stem provided with two retractable wedges. This stem is represented in figure 2.

Lateral sides (9) and (10) present the shape of an isosceles trapezium.

The edges of all the sides of the cage and the ones of the wall are provided with notches (11) which profile is studied to diminish the risk of secondary movings.

In that way, the cage will allow, after conceivable moving, the bone fusion to happen in good conditions.

Moreover, the non-magnetic properties of the material used for the creation of the cage will allow doing scanner or MRI exams without artifacts.

These exams are made easier by the existence of a radiopac mark vertically incorporated in the center of the median wall, which will allow quantifying the compression or the potential moving of the cage.